THE 900-YR SEDIMENTARY RECORD OF LAGO THOMPSON, NORTHERN CHILEAN PATAGONIA

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We evaluate the climate and environmental variability of Northern Chilean Patagonia during the Last Millennium, using a multi-proxy analysis of a sediment core from Lago Thompson (area 1km^2; 750 masl; 45°S, 71°W). The present-day climate co nditions around the lake are relatively dry (annual precipitation ~500 mm), and the local vegetation is dominated by pasturelands and remnants of the native Subantarctic Nothofagus forest. In 2008, we surveyed the lake bathymetry with an echo-sounder and we collected several 1m- long sediment cores with an Uwitec gravity corer. The sediment cores, which are composed of light brown organic-rich clayey silt, were analyzed for sedimentology, mineralogy and geochemistry. The radiocarbon ages, measured on bulk sediment and macro-remains, demonstrate that the core covers the last 900 years. Visual descriptions and X-ray radiographies show that the sediment record is relatively undisturbed. The lower part of the core is finely laminated whereas the upper part appears more homogeneous. Magnetic susceptibility highlights the presence of two tephra layers. The biogenic silica content of the sediment is high (40 to 80%), in relation to the small catchment to lake surface ratio, which limits the supply of terrestrial particles to the lake. By comparison, the inorganic content of the sediment is very low. Some clay minerals, quartz and feldspars were identified by X-ray diffraction. The high organic matter content (mean 15%) and its low C/N ratio (8) throughout the core, evidence that the lake productivity remained high over the last 900 years. Higher concentrations in biogenic silica and organic matter between 1550 and 1800 AD could be interpreted as drier climate conditions in Northern Patagonia during the Little Ice Age. Further research will focus on biological proxies.

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